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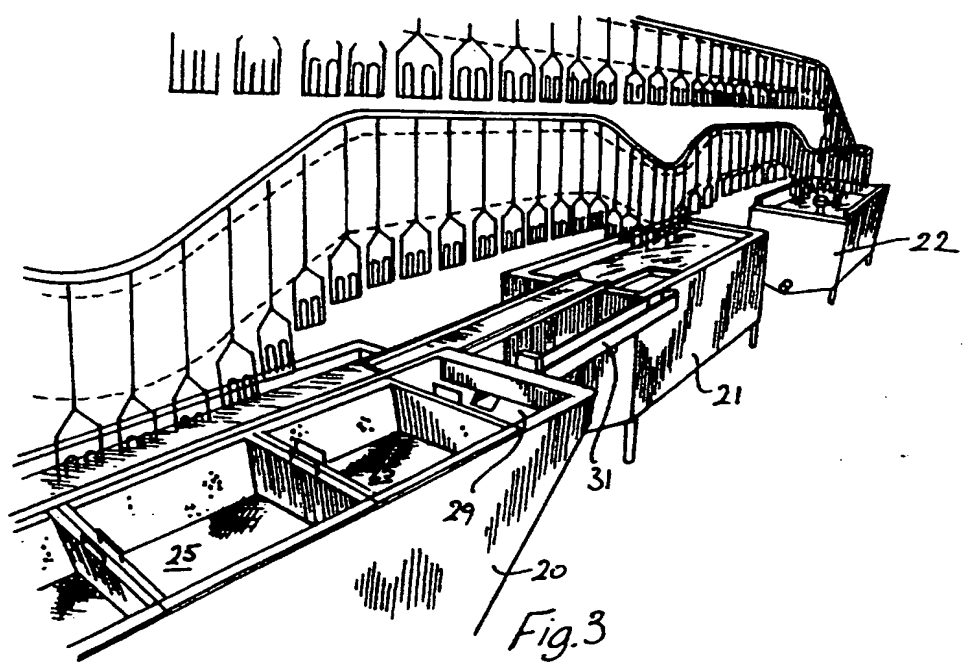
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(54) Processing poultry

(57) In processing ducks, a plucked duck is dipped in a bath 20 of hot wax and then dipped in a bath 21 of cooler wax. The wax is cooled in water bath 22 and the cooled wax is stripped off together with any remaining feathers. The ducks are then eviscerated and circulated through a chilling room. The chilled ducks are weighed and graded prior to packaging.



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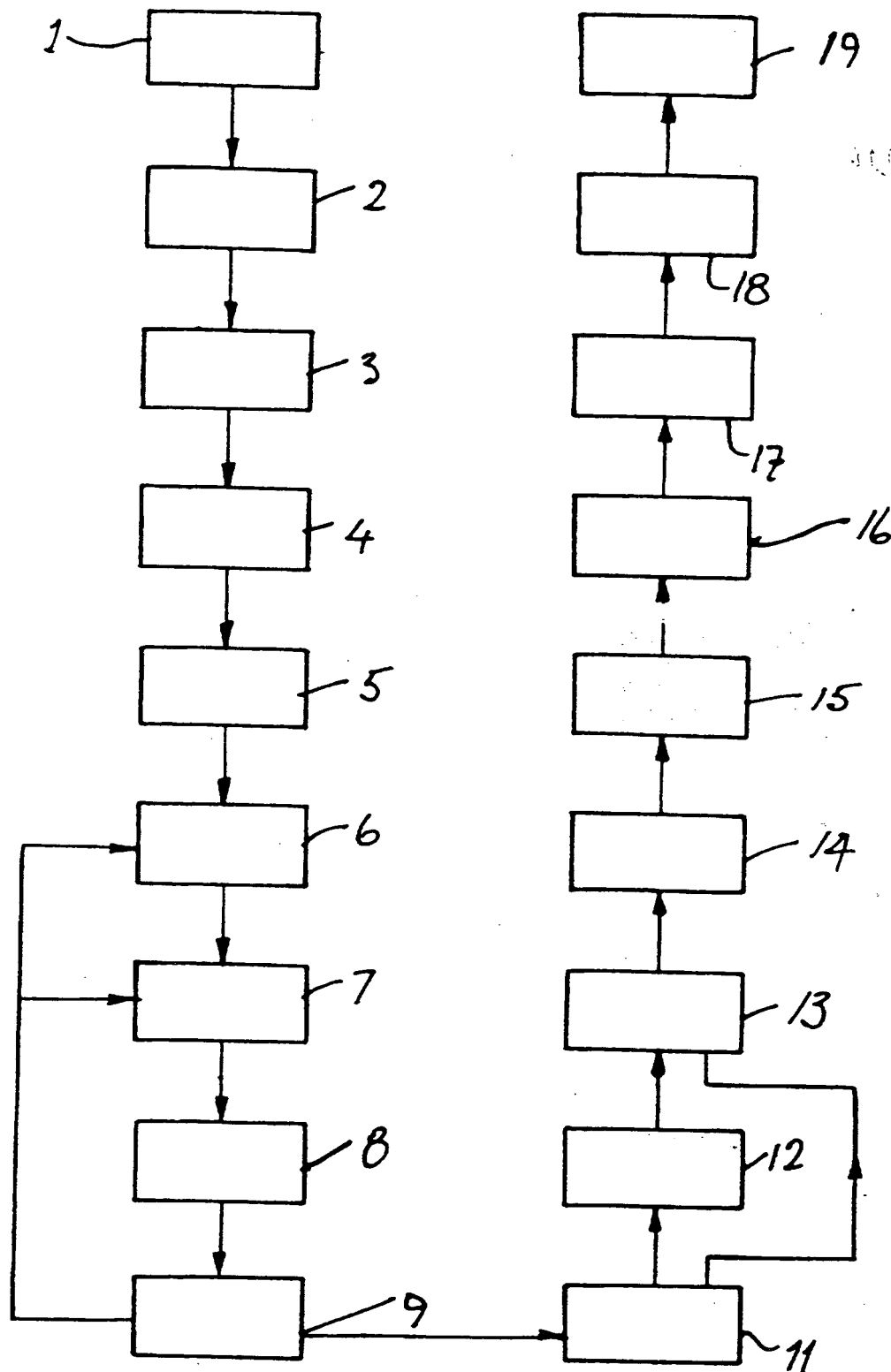
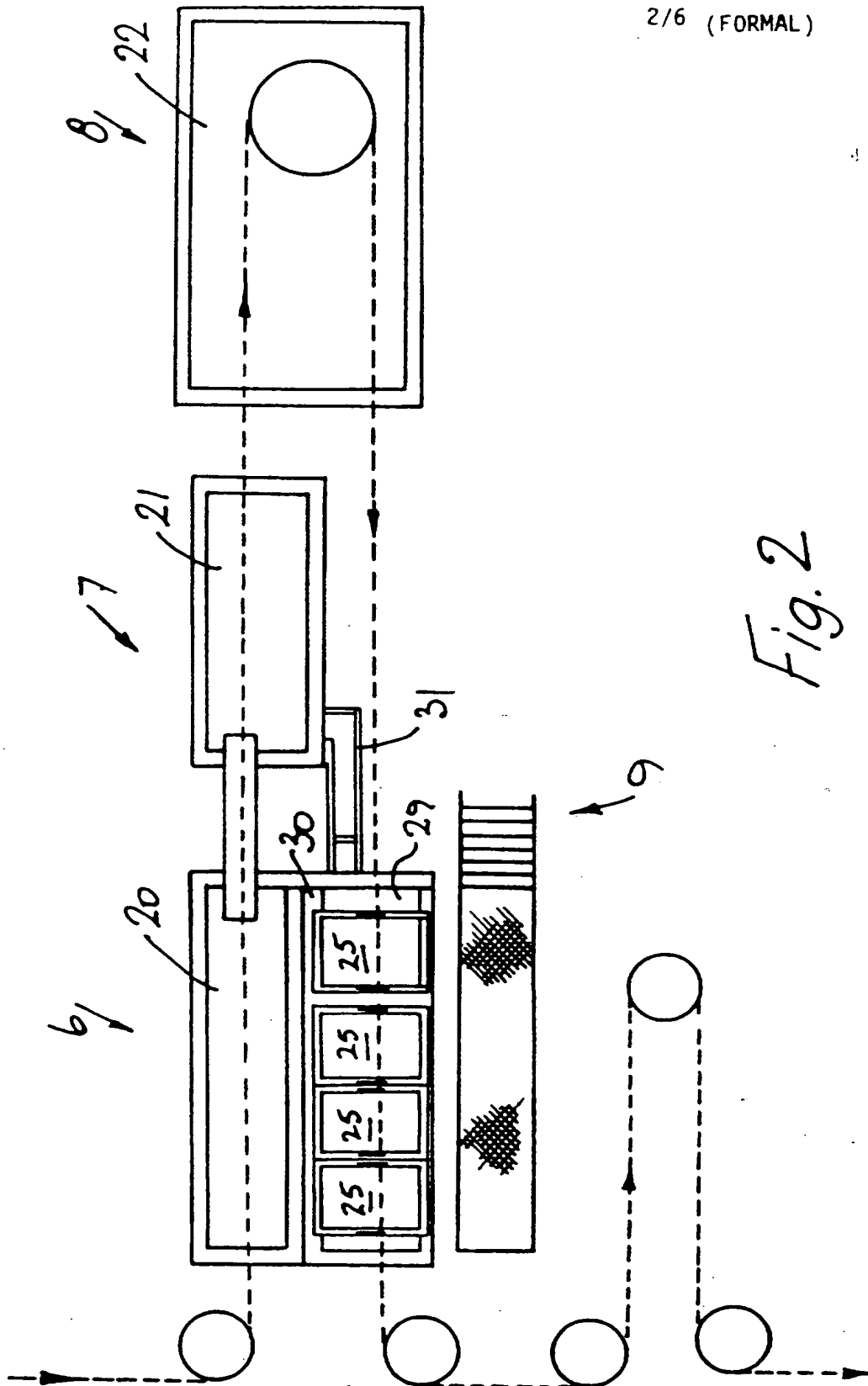
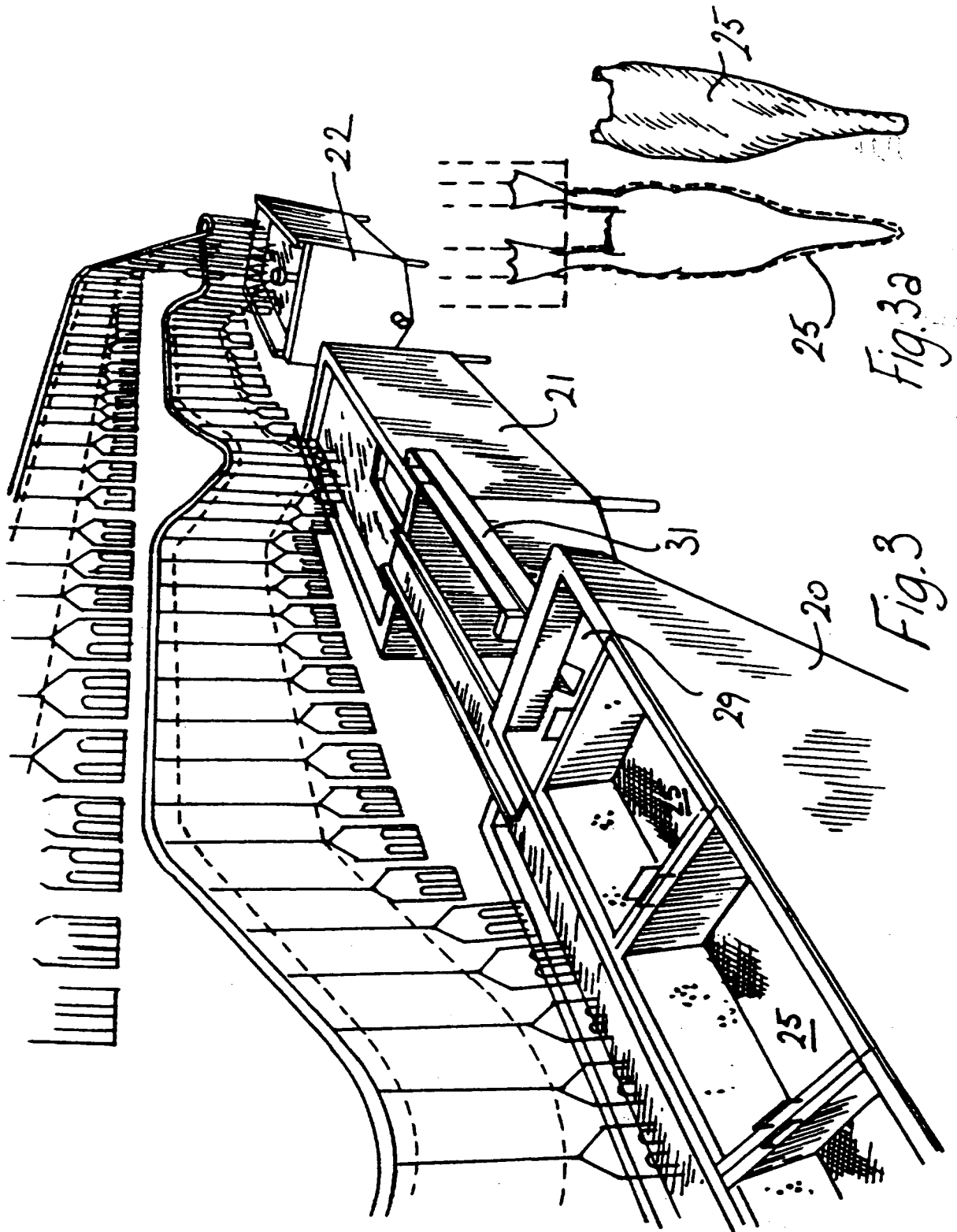
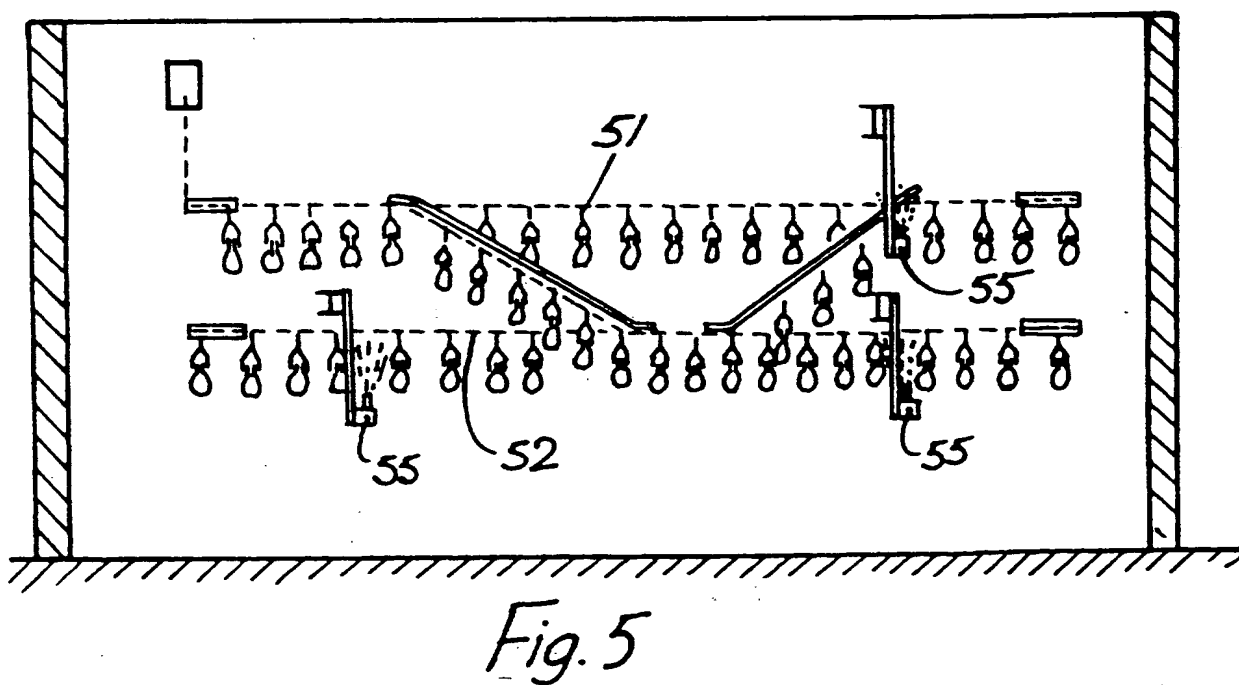
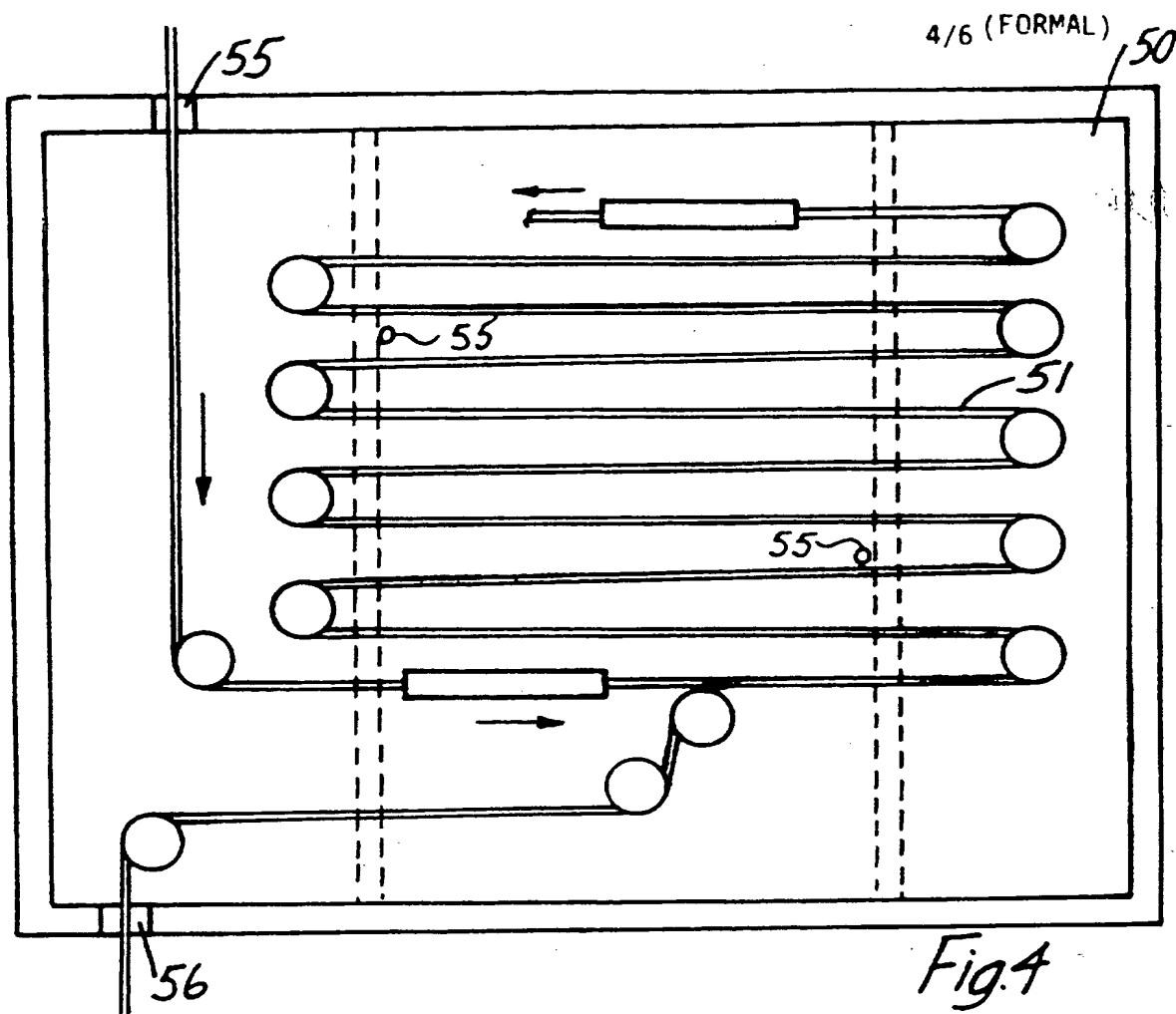


Fig.1







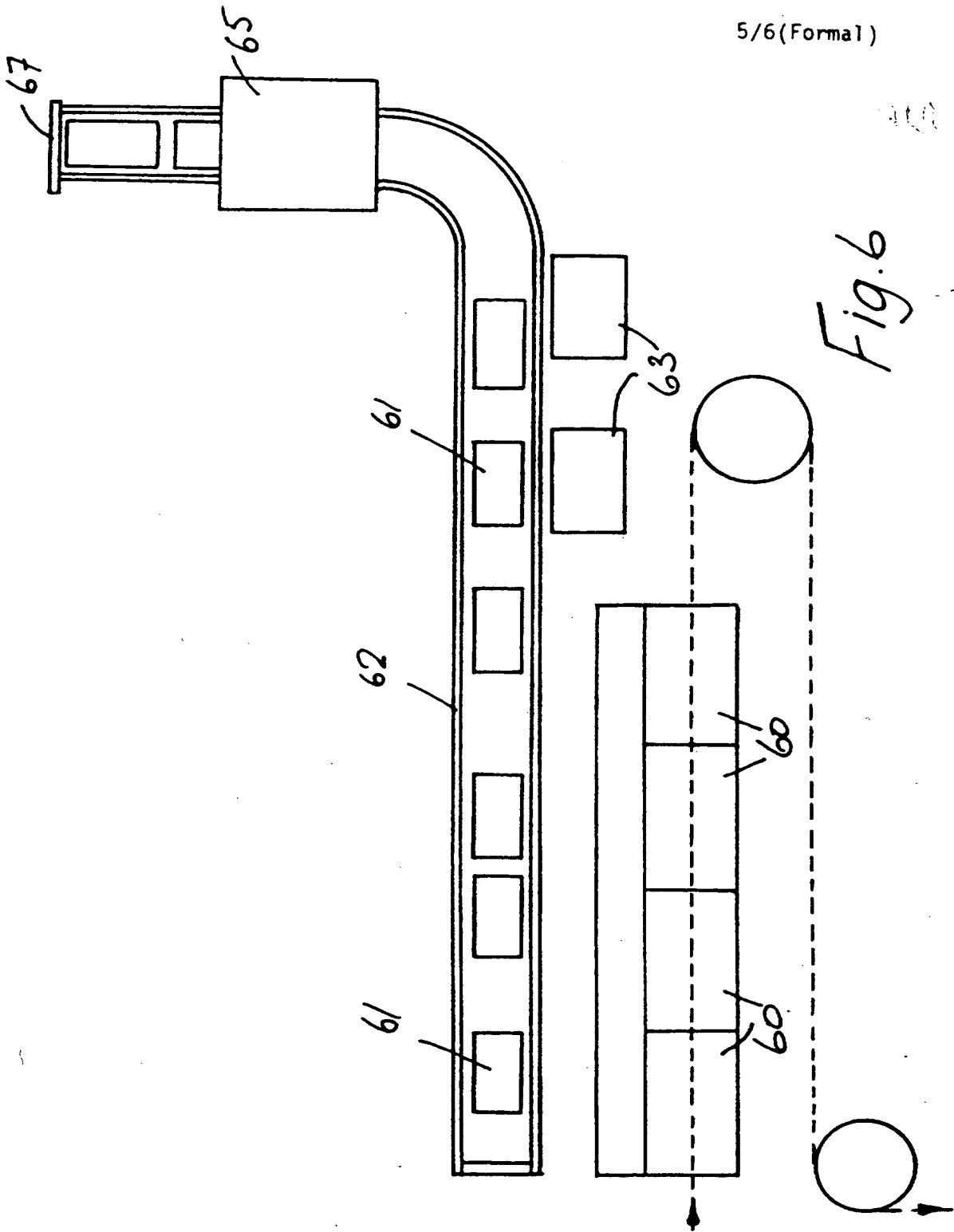


Fig. 6

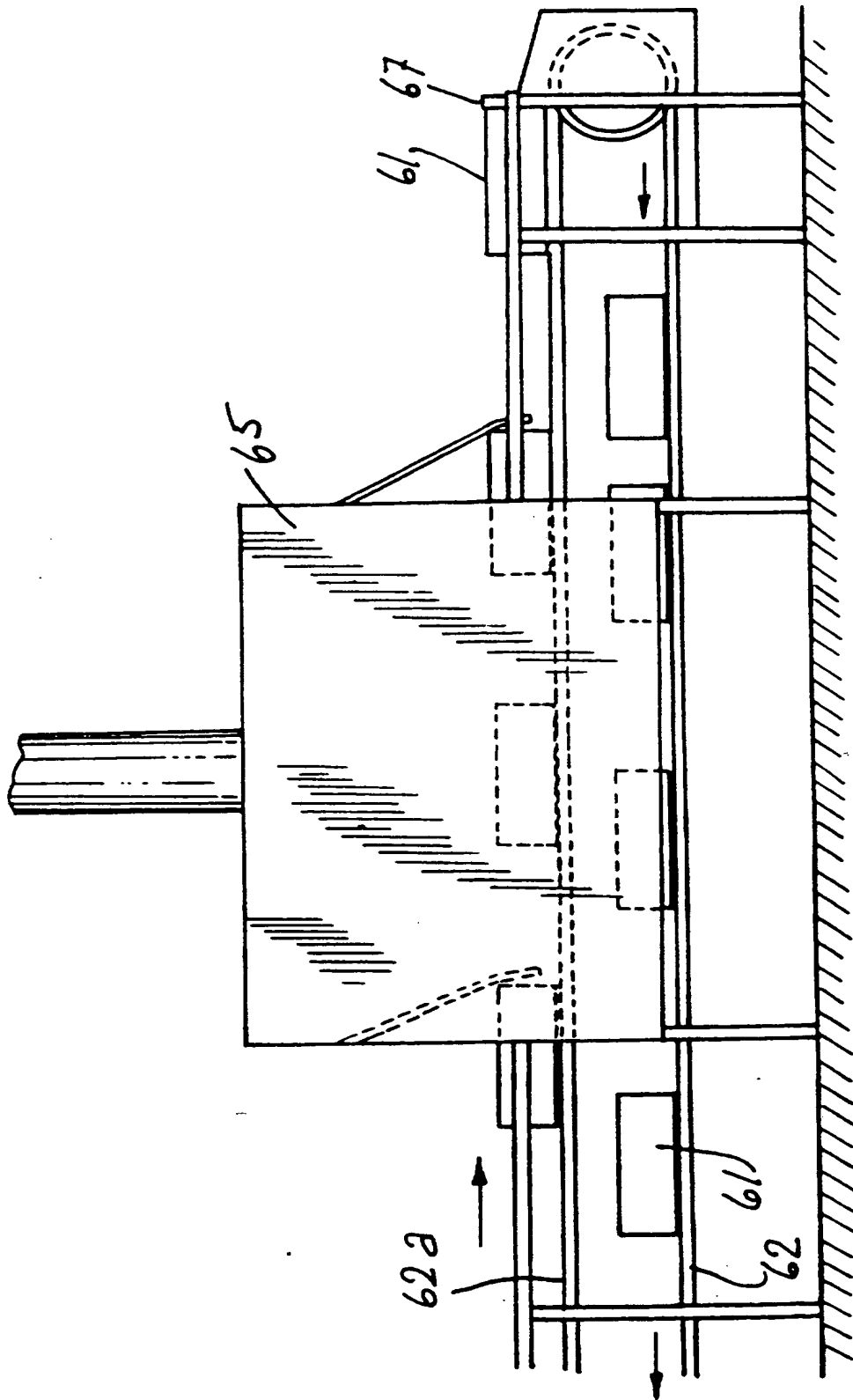


Fig. 7

"Processing Poultry"

The invention relates to a method for processing poultry and in particular to a method for processing ducks.

5 There are several difficulties in processing poultry, particularly ducks. One of the particular problems associated with processing ducks is the removal of all the feathers. Conventional scalding and waxing operations do not effectively remove all the feathers which leads to a processed duck of inferior quality. There are also
10 considerable difficulties in adequately chilling the processed ducks without increasing the moisture content significantly. There are further difficulties in handling the processed ducks for packaging.

15 This invention is directed towards providing a method for processing poultry, particularly ducks, in an efficient manner to achieve high quality processed poultry.

According to the invention there is provided a method for processing poultry comprising the steps of:

- hanging the poultry on individual support hooks;
- 20 stunning the poultry;
- killing the poultry;
- scalding the poultry to soften the feathers;
- plucking feathers from the scalded poultry;
- 25 dipping the poultry in a bath of hot wax at a temperature of from 100 to 130°C;

dipping the poultry coated with hot wax in a bath of cooler wax at a temperature of from 50 to 80°C;

cooling the wax to solidify the wax on the poultry;

5 stripping the wax and remaining feathers from the poultry;

separating the feathers from the wax;

recycling the wax;

eviscerating the poultry;

chilling the poultry;

10 weighing the poultry and grading the poultry accordingly; and

packing the poultry.

15 In a particularly preferred embodiment of the invention the poultry is dipped in a bath of hot wax at a temperature of approximately 110°C.

Preferably, the poultry is dipped in a bath of cooler wax at a temperature of from 60 to 65°C.

20 In a preferred arrangement the wax in both the hot and cooler baths is of the same formulation. Typically, the wax comprises a mixture of paraffin wax and micronised wax.

In a preferred arrangement, the wax is recycled by collecting the wax stripped from the poultry in a storage

tank and releasing wax from the storage tank to one or both of the hot and cooler wax baths on demand.

Preferably the wax is chilled by dipping the waxed poultry in a bath of cool water.

5 In a preferred arrangement the poultry is chilled in a cold air chiller at a temperature of from 3 to 7°C for a period of at least 1 hour. Preferably, the poultry is chilled in a cold air chiller at from 4 to 6°C for a period of approximately 1.5 hours. In an especially preferred
10 arrangement during chilling, chilled water is sprayed into the cold air in the chiller.

Most preferably, the poultry is chilled to achieve a water content of less than 1% by weight.

15 In one embodiment of the invention the poultry is packed by placing the graded poultry into a bag in a tray on an outward leg of a conveyor;

evacuating air from the bag;

sealing the bag;

20 conveying the bag in the tray on the conveyor to a blast freezer;

removing the frozen poultry from the tray; and

placing the tray on a return leg of the conveyor.

Preferably the outward leg of the conveyor lies above the return leg of the conveyor.

Preferably also the conveyor comprises an endless conveyor which is turned through substantially 180° between the forward and return legs and the return and forward legs.

5 In a preferred arrangement the method includes the steps of stopping a full tray at the end of the forward leg for removing poultry from the conveyor and for returning an empty tray to the return leg.

10 Preferably also the method includes the steps of stopping an empty tray at the end of a return leg for placing an empty tray on the forward leg of the conveyor.

The invention also provides poultry especially ducks whenever processed by the method of the invention.

15 The invention will be more clearly understood from the following description thereof, given by way of example only with reference to the accompanying drawings, in which:-

Fig. 1 is a flow chart illustrating a method for processing poultry according to the invention;

20 Fig. 2 is a plan view illustrating waxing steps in the method of the invention;

Fig. 3 is a perspective view of various waxing steps in the method of the invention;

Fig. 3(a) is a view of poultry after a waxing stage of the invention;

25 Fig. 4 is a top plan view of a chilling room used in the method of the invention;

Fig. 5 is a diagrammatic side elevational view of the chilling room of Fig. 4;

Fig. 6 is a plan view of packaging steps in the method of the invention; and

5 Fig. 7 is a side view of part of the packaging steps of Fig. 6.

Referring to the drawings, and initially to Fig. 1 in a method for processing poultry according to the invention, poultry, particularly a duck, is hung in step 1 on
10 individual support hooks. In step 2 the duck is stunned prior to chilling and bleeding in step 3. To soften the feathers, the duck is scalded in step 4 and after softening, the feathers are plucked in step 5. Particularly in the case of ducks, there are considerable
15 difficulties in removing all of the feathers. This is because of the natural tendency of the feathers to resist water treatment.

In a first waxing stage in step 6, the duck is dipped in a bath of hot wax at a temperature of from 100-130°C, most
20 preferably approximately 110°C. In a second waxing step 7, the duck which has been dipped in the bath of hot wax is then dipped in a bath of cooler wax which is at a temperature of from 50-80°C, most preferably from 60-65°C. After dipping in the cooler wax, the wax is cooled in step
25 8 to solidify the wax on the duck. The duck is then coated with a skin of cooled wax and passes to a stripping station 9 at which the skin of wax, together with remaining feathers from the duck, are stripped off. The wax removed in the stripping process is recycled along
30 line 10 to either the first or second waxing steps 6 or 7 as will be described in more detail below.

The necks of the ducks from which all of the feathers have been removed are slit in step 11. The head is optionally removed in step 12, the vent is removed in step 13, and the duck is fully eviscerated in step 14. After evisceration, the inside and outside of the duck is sprayed in step 15 with cleaning water. The feet of the duck are cut off in step 16 and the duck is then chilled in step 17 as will be described in more detail below. After chilling, the duck is weighed and graded in step 18 prior to packing in step 19.

In more detail and referred to Figs. 2 and 3, the first hot waxing is carried out in a first wax bath 20 containing the hot wax into which the duck is dipped. The duck with the hot wax applied is then dipped into a second wax bath 21 containing the cooler wax. After dipping in the cooler wax, the duck is dipped in a water bath 22 which chills the wax to assist it in solidifying around the duck to form a skin of wax 25 as illustrated in Fig. 3(a) which is stripped off at the stripping station 9. The wax containing the remaining feathers on the duck that is stripped off is delivered into baskets 25, the feathers remaining in the baskets 25 to be removed as required and the wax collecting in a recycle wax tank 29. The recycled wax from the tank 29 may be recycled either to the hot wax bath 20 through a gate valve 30 or along a valved recycle line 31 to the cooler wax bath 21.

Referring to Figs. 4 and 5, the ducks which have been eviscerated are chilled in step 17 in a chilling room 50. The ducks are circulated through the chilling room along an upper circuitous path 51 and a lower circuitous path 52. The ducks enter the chilling room 50 through an inlet 55 and exit through an outlet 56. At three locations 55 in the chiller room, chilled water is sprayed into the air circulating in the chiller room to assist in chilling the

ducks while avoiding excess water retention. Preferably the chilling water take up is less than 1% by weight of the duck.

5 Referring to Figs. 6 to 7, chilled ducks are automatically weighed and graded into one of four grading bins 60. The graded ducks are then packed into trays 61 which travel on a conveyor 62 to one of two stations 63 at which a duck is packed into a plastic bag, air is evacuated from the bag and the bag is sealed before being returned to the 10 tray 61. The trays pass along the conveyor 62 to a blast chiller 65.

As will be particularly apparent from Fig. 7, the conveyor 62 includes an upper forward leg 62(a) and a lower return leg 62(b). Packed trays are led along the upper forward 15 legs 62 through the freezer 65 and are stopped at the end of the conveyor by a stop bar 67. After removal of the packed ducks from the tray 61, empty trays are returned along the lower leg 62(b) of the conveyor to the grading station 60. At the end of the lower leg 62(b) of the 20 conveyor, the trays are again stopped and transferred to the upper leg 62(a).

The invention provides a highly efficient optimised integrated method for processing poultry, particularly ducks to a very high quality standard.

25 The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and detail.

CLAIMS

1. A method for processing poultry comprising the steps of:
 - hanging the poultry on individual support hooks;
 - 5 stunning the poultry;
 - killing the poultry;
 - scalding the poultry to soften the feathers;
 - plucking feathers from the scalded poultry;
 - 10 dipping the poultry in a bath of hot wax at a temperature of from 100 to 130°C;
 - dipping the poultry coated with hot wax in a bath of cooler wax at a temperature of from 50 to 80°C;
 - 15 cooling the wax to solidify the wax on the poultry;
 - stripping the wax and remaining feathers from the poultry;
 - separating the feathers from the wax;
 - recycling the wax;
 - 20 eviscerating the poultry;
 - chilling the poultry;

weighing the poultry and grading the poultry accordingly; and

packing the poultry.

- 5 2. A method as claimed in claim 1 wherein the poultry is dipped in a bath of hot wax at a temperature of approximately 110°C.
3. A method as claimed in claim 1 or 2 wherein the poultry is dipped in a bath of cooler wax at a temperature of from 60 to 65°C.
- 10 4. A method as claimed in any preceding claim wherein the wax in both the hot and cooler baths is of the same formulation.
5. A method as claimed in any preceding claim wherein the wax comprises a mixture of paraffin wax and micronised wax.
- 15 6. A method as claimed in any preceding claim wherein the wax is recycled by collecting the wax stripped from the poultry in a storage tank and releasing wax from the storage tank to one or both of the hot and cooler wax baths on demand.
- 20 7. A method as claimed in any preceding claim wherein the wax is chilled by dipping the waxed poultry in a bath of cool water.
- 25 8. A method as claimed in any preceding claim where in the poultry is chilled in a cold air chiller at a temperature of from 3 to 7°C for a period of at least 1 hour.

9. A method as claimed in claim 8 wherein the poultry is chilled in a cold air chiller at from 4 to 6°C for a period of approximately 1.5 hours.
- 5 10. A method as claimed in claim 8 or 9 wherein, during chilling, chilled water is sprayed into the cold air in the chiller.
11. A method as claimed in any preceding claim wherein the poultry is chilled to achieve a water content of less than 1% by weight.
- 10 12. A method as claimed in any preceding claim wherein the poultry is packed by placing the graded poultry into a bag in a tray on an outward leg of a conveyor;
- 15 evacuating air from the bag;
- sealing the bag;
- conveying the bag in the tray on the conveyor to a blast freezer;
- removing the frozen poultry from the tray; and
- 20 placing the tray on a return leg of the conveyor.
13. A method as claimed in claim 12 wherein the outward leg of the conveyor lies above the return leg of the conveyor.
- 25 14. A method as claimed in claim 12 or 13 wherein the conveyor comprises an endless conveyor which

is turned through substantially 180° between the forward and return legs and the return and forward legs.

- 5 15. A method as claimed in any of claims 12 to 14 wherein the method includes the steps of stopping a full tray at the end of the forward leg for removing poultry from the conveyor and for returning an empty tray to the return leg.
- 10 16. A method as claimed in any of claims 12 to 15 wherein the method includes the steps of stopping an empty tray at the end of a return leg for placing an empty tray on the forward leg of the conveyor.
- 15 17. A method of processing poultry substantially as hereinbefore described with reference to the accompanying drawings.
18. Poultry whenever processed by a method as claimed in any preceding claim.
- 20 19. Ducks whenever processed by a method as claimed in any of claims 1 to 17.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

Application number
 GB 9424589.1

Relevant Technical Fields

- (i) UK C (Ed.N) A2U
 (ii) Int Cl (Ed.6) A22C 21/04

Search Examiner
 K J KENNETT

Date of completion of Search
 3 MARCH 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-
 1-19

(ii)

Categories of documents

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Category	Identity of document and relevant passages	Relevant to claim(s)
A	GB 2280093 A (MONAGHAN) Claims	1
A	GB 1570874 (PRITCHETT) whole document	1

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